(12) UK Patent Application (19) GB (11) 2 143 024 A

(43) Application published 30 Jan 1985

(21) Application No 8318179

(22) Date of filing 5 Jul 1983

(51) INT CL³
F23D 15/00

(52) Domestic classification
F4T 234 GM
U1S 1955 2400 F4T

(56) Documents cited
GB 1370326
GB 0936752
GB 0344648

(58) Field of search
F4T

(71) Applicant
Burco Dean Limited (United Kingdom),
Rosegrove, Burnley, Lancashire BB12 6AL

(72) Inventors
John Rex Hibbert,
Arthur Selwyn Kay

(74) Agent and/or Address for Service
Marks & Clerk,
Scottish Life House, Bridge Street, Manchester M3 3DP

(54) Gas burner head

(57) A gas burner head comprises an ignition plate 20 adapted to mount an ignition electrode 35 forming part of an electronic ignition circuit, a burner port ring 21 adapted to be located loosely but non-rotatably on the ignition plate and a cap 22 adapted freely to sit on the burner plate to close it. The burner port ring has a series of radial apertures 42 with two adjacent apertures located near the ignition electrode merging to provide a horizontally-extended aperture to allow the gas flame to spread and stabilise under adverse draught and low gas supply rate conditions.

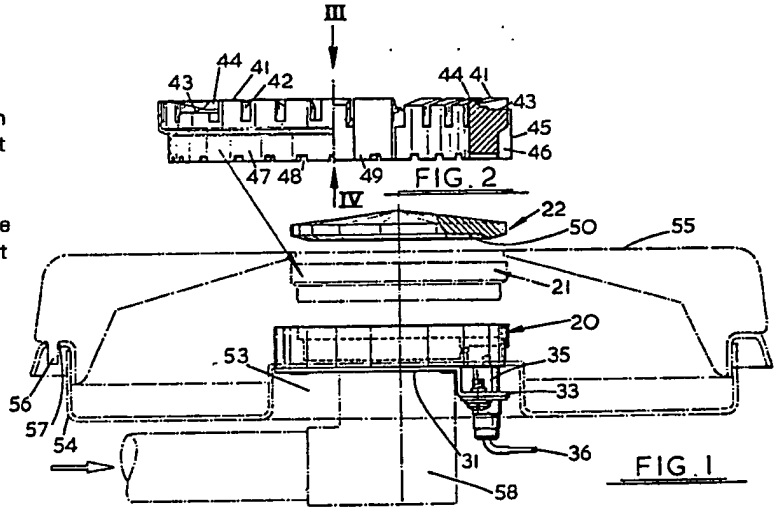

FIG. 2

FIG. 1

GB 2 143 024 A

The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.
The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

2143724

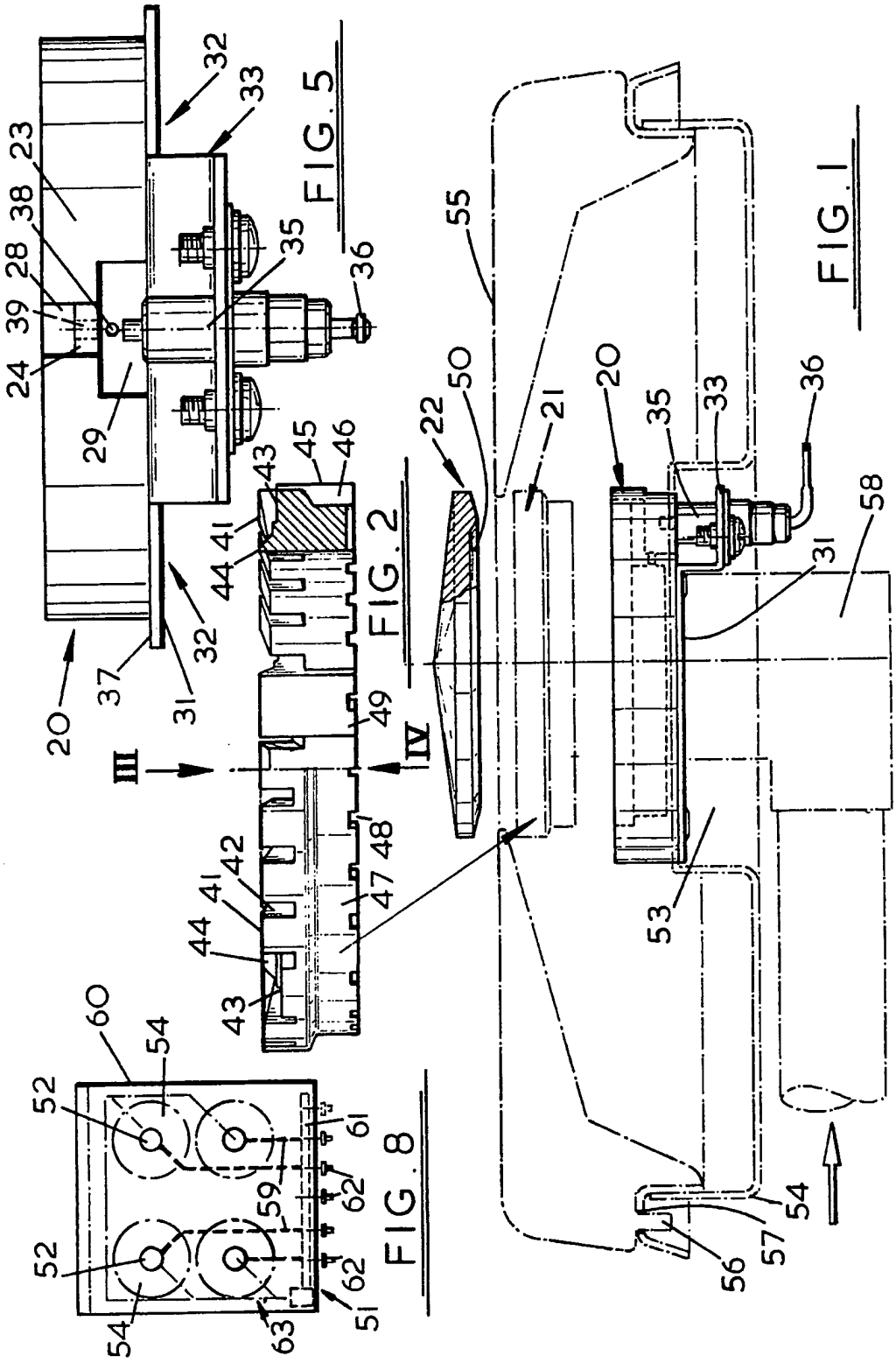
FIG. 5
FIG. 2
FIG. 1
FIG. 8
III
IV
20
21
22
23
24
28
29
31
32
33
35
36
37
38
39
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63

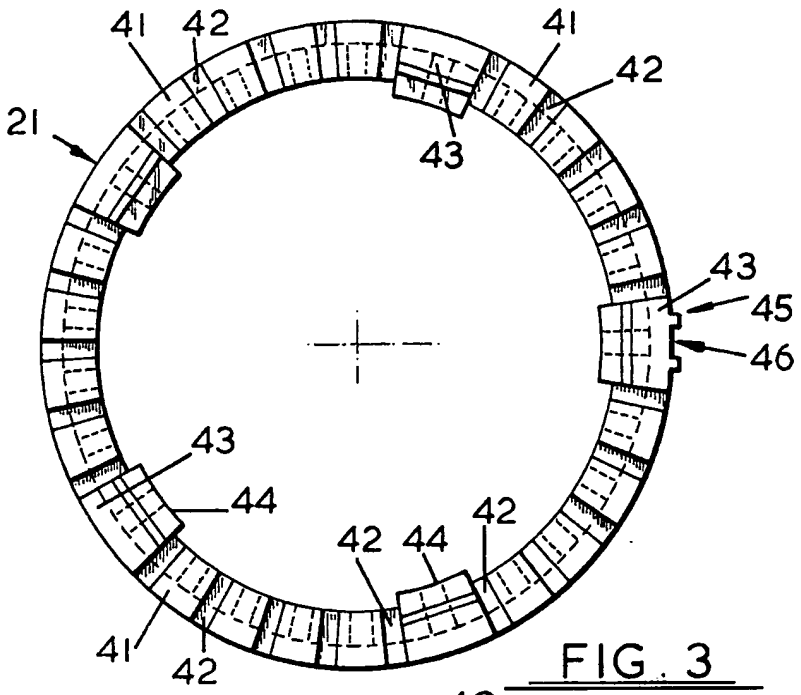
41
42
41
42
21
43
43
45
46
43
44
42
44
42
41
42

FIG. 3

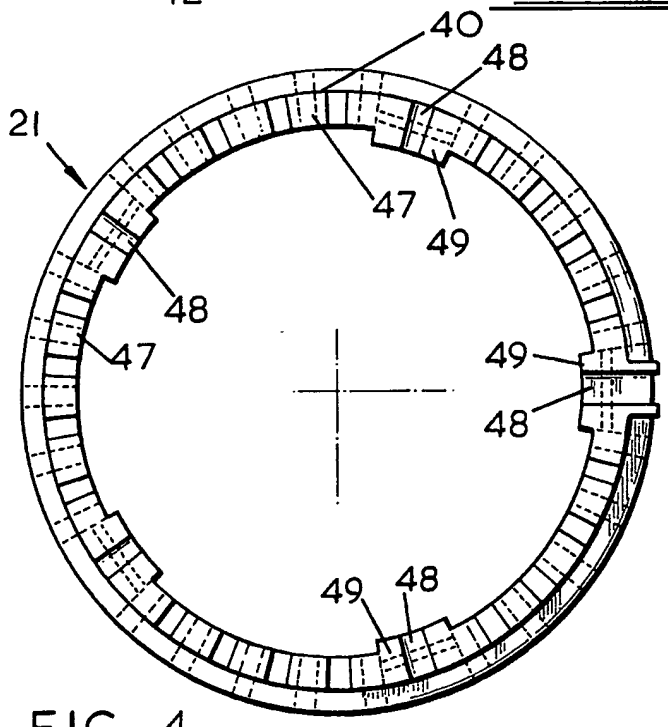
40
48
21
47
49
48
47
49
48
49
48

FIG. 4

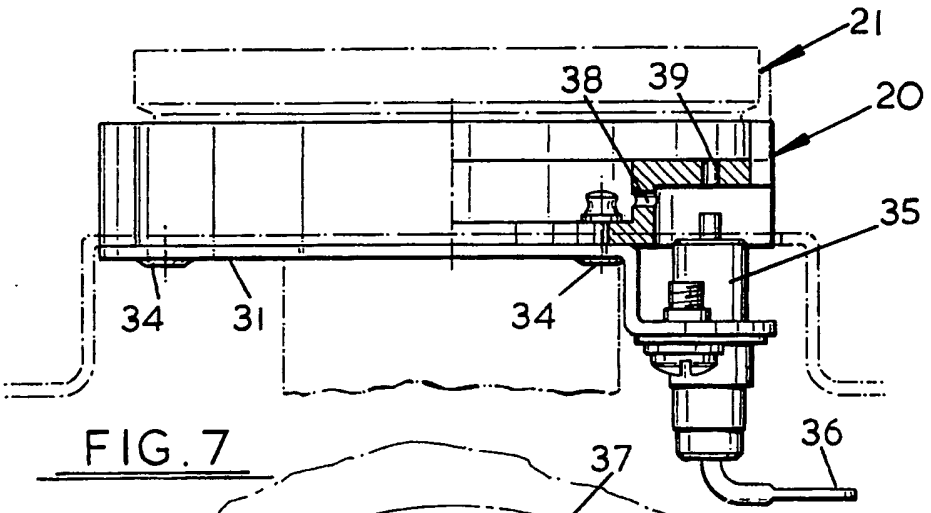
21
38
39
20
35
34
31
34
36

FIG. 7

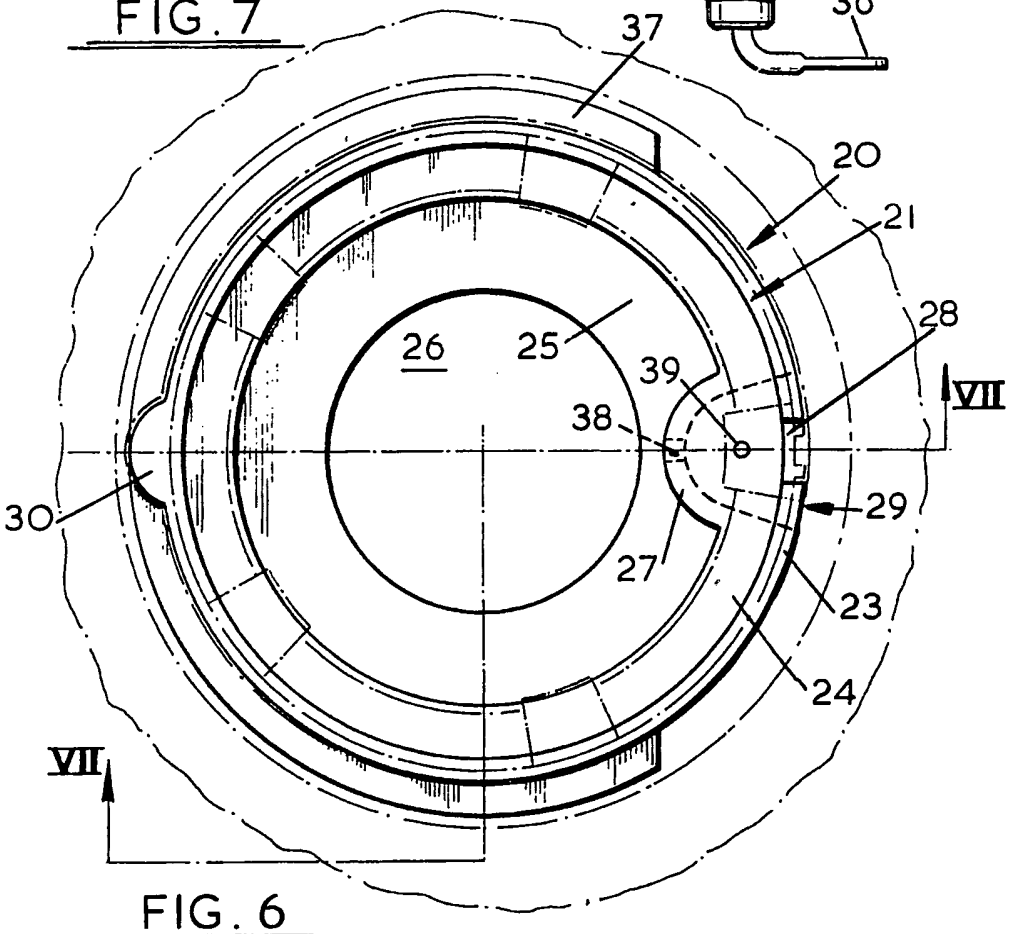
37
20
21
28
26
25
39
38
VII
30
29
27
23
24
VII

FIG. 6

SPECIFICATION

Gas burners

This invention relates to gas burners and in particular gas burner heads for use in cookers.

The gas burner of this invention is an improvement or modification of the gas burners disclosed in our United Kingdom Patent No. 1 572 096 and Patent Applications Nos. 82 21485 and 83 01041, especially the latter which discloses a three part burner head.

It is an object of the present invention to provide a gas burner head which provides a stable gas flame under adverse draught conditions with a low gas supply rate.

According to the invention there is provided a gas burner head comprising an ignition plate adapted to mount an ignition electrode forming part of an electronic ignition circuit, a burner port ring adapted to be located loosely but non-rotatably on the ignition plate and a cap adapted freely to sit on the burner port ring to close same, the burner port ring comprising a series of radial apertures with at least two adjacent apertures at at least the ignition electrode location merging to provide a horizontally-extended aperture to allow the gas flame to spread and stabilise under adverse draught and low gas supply rate conditions.

Preferably, five such horizontally-extended apertures are provided around the burner port ring at equi-spaced intervals.

Preferably the upper surface of the burner port ring is of castellated formations with the upper surfaces of the castellations downwardly inclined towards the centre of the ring, the castellations at the horizontally-extended aperture locations being of lesser height than the other castellations at the ring outer circumference to define said apertures with the cap and castellations immediately adjacent thereto.

Preferably the lesser height castellations are circumferentially longer than the other castellations.

Preferably the lesser height castellations are at the inner circumference of the burner port ring inclined upwardly to engage a dished configuration in the lower surface of the cap to resist lateral disengagement of the latter.

The lower surface of the burner port ring is also preferably of castellated configuration but shallower than the upper castellations and rests on an internal ledge in the ignition plate which is annular in configuration.

Preferably the burner port ring has a projection on its outer surface adapted to engage a slot in a circumferential wall of the ignition plate at the ignition electrode location to prevent relative rotation therebetween.

Preferably the projection is grooved to assist gas flow to the ignition electrode.

Preferably the ignition plate is cut away horizontal at its lower surface to provide an ignition chamber for the ignition electrode.

Preferably the ignition plate is formed with small-diameter through-apertures upwardly and inwardly of the plate at the combustion chamber.

The ignition plate, burner port ring and cap are formed of sintered iron and treated to give a black oxide protection coating while providing an attractive appearance.

The gas burner head according to this invention can burn natural gas, Towns gas or liquid petroleum. All that is required is an adaptation of the fuel supply injector tap associated with the gas burner head.

The ignition electrode is mounted relative to the combustion chamber by a stepped metal plate rivetted to the underside of the ignition plate.

Also according to the present invention there is provided a cooker incorporating at least one gas burner head as hereinbefore defined and associated with a centrally apertured spillage tray within the centre of which the gas burner head is located and a separable pan support.

Complementary formations on the spillage tray and pan support prevent relative rotation therebetween as is usual.

The cooker is preferably a hob comprising a shallow tray to which a top apertured to receive spillage trays, pan supports and gas burner heads is secured, the tray being of a depth equivalent to a conventional worktop thereby permitting a drawer for example to be fitted immediately under the hob.

The hob preferably has an ignition circuit connected to each gas burner head and a gas supply manifold pipe from which gas is supplied to the gas burner heads by Venturi or non-Venturi pipes there being an injector tap for each gas burner head.

These pipes are preferably horizontally arranged and are formed of aluminium so that they are easily configured to a convenient layout in the cooker tray. Preferably the pipes are bonded or cemented to a burner elbow connected to the ignition ring say by being peened over the stepped plate.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which

Figure 1 is an exploded, part-sectional, side view of a gas burner head assembly according to the invention;

Figure 2 is a part sectional side view of the burner port ring;

Figures 3 and *4* are views of the burner port ring in the direction of the arrows III and IV of Figure 2;

Figure 5 is a side view of the ignition plate;

Figure 6 is a plan view of the ignition plate;

Figure 7 is a sectional view of the line VII-VII of Figure 6; and

Figure 8 is a plan view of a cooker hob incorporating the present invention.

The gas burner head comprises an ignition plate 20, a burner port ring 21 and a cap 22, all made of powdered sintered iron and black oxide treated. As a result no machining of the burner port ring 21 is necessary.

The ignition plate 20 is of annular configuration with a circumferential wall 23, an inner ledge 24 and a bottom 25 apertured to provide a central hole 26.

The ledge 24 is extended inwardly as indicated at 27 at a cut-out or slot 28 in the circumferential wall 23. The latter is horizontally cut away as indicated at 29 at the slot 28 and under the extended ledge to provide a combustion chamber.

A circumferential locating formation 30 is provided diametrically opposite the slot 28 for a purpose hereinafter referred to.

An aluminium coated steel plate 31 chordally cut away as indicated at 32 and of stepped configuration under the combustion chamber as indicated at 33 is rivetted to the underside of the ignition plate 20 as indicated at 34. This plate 31 mounts an ignition electrode 35 adapted to be coupled into an electronic ignition circuit by a terminal 36. The plate 31 extends circumferentially beyond the ignition plate 20 as indicated at 37.

The ignition plate 20 is formed with gas supply holes 38 and 39.

The burner port ring 21 is, as indicated at 40, of lesser diameter in the lower half of its height so that it can rest on the ledge 24 of the ignition plate 20. Its upper surface (see Figures 2 and 4) is of castellated configuration as is its lower surface (see Figures 2 and 3) but with the lower castellations being shallower than the upper ones.

The upper castellations 41 define radial slots 42. The upper surfaces of the castellations 41 and slots 42 slope downwardly and inwardly.

At five equi-angularly spaced locations there is a circumferentially longer castellation 43 which is shorter in depth than the castellations 41 and which merges with two adjacent slots 42 to define a horizontally-extended aperture, one of which is at the slot 28 in the ignition plate 20. Each castellation 43 from its outer circumference is initially horizontal and then slopes sharply upwardly at its inner circumference to provide a tooth 44 (see particularly Figure 2).

These castellations 43 are of greater radial length than the castellations 41 and serve to locate the cap 22 as will be later described.

The castellation 43 which is located in alignment with the slot 28 of the ignition plate 20 projects circumferentially outwards at 45 to engage in the slot 28 so that when the burner port ring 21 is sitting on the ledge 24 relative rotation between the ignition plate 20 and the burner port ring 21 is prevented. The circumferential face of projection 45 is recessed as indicated at 46 for gas flow to the combustion chamber.

As aforesaid, the lower surface of the burner port ring 21 is castellated, the castellation 47 defining radial slots 48.

The castellations 49 corresponding to the castellations 43 are of greater radial length than the castellations 47.

The castellations 47 and 49 define with the ledge 24 secondary gas supply or flame apertures or passages (radial slots 48).

The primary gas supply or flame apertures or passages are the slots 42 including the five horizontally-extended slots delineated by the burner port ring 21 and the cap 22 which in its lower surface is of dished configuration as indicated at 50. The teeth 44 of the burner port ring 21 engage the periphery of this dished area to prevent lateral dislodgement of the cap 22 from the burner port ring 21.

The gas burner head thus comprises three separable components which facilitate its cleaning, maintenance and repair and which make it relatively economic to manufacture.

In use, say, in a hob cooker generally indicated at 51 each gas burner head 52 (four in the example diagrammatically illustrated) is located in the central aperture 53 of a removable spillage tray 54 on which rests a removable pan support 55. The latter has two projections 56 (only one shown) engageable in holes 57 of the spillage tray 54 to prevent relative rotation.

Each burner head 52 has secured to it, say, by plate 31 an elbow 58 into which is cemented or bonded an aluminium gas supply pipe 59 which may be of Venturi or non-Venturi construction. These pipes 59 are horizontally disposed in a shallow tray 60 of a depth equivalent to a conventional kitchen worktop and are connected to a gas supply manifold pipe 61 by injector taps 62. The ignition circuit which is connected to each ignition electrode 35 is generally indicated at 63.

The tray 60 is closed save at the spillage tray locations by a glass or metal top (not shown).

The shallow nature (in depth terms) of the tray 60 and the gas burner heads 52 permit the cooker hob to be mounted on a worktop surface with a drawer immediately below same.

The gas burner head of this invention can be installed in a shallow hob of 30 mm depth below a working surface.

CLAIMS

1. A gas burner head comprising an ignition plate adapted to mount an ignition electrode forming part of an electronic ignition circuit, a burner port ring adapted to be located loosely but non-rotatably on the ignition plate and a cap adapted freely to sit on the burner port ring to close same, the burner port ring comprising a series of radial apertures with at least two adjacent apertures at at least the ignition electrode location merging to provide a horizontally-extended aperture to allow the gas flame to spread and stabilise under adverse draught and low supply rate conditions.

2. A gas burner head as claimed in claim 1, in which five such horizontally-extended apertures are provided around the burner port ring at equi-spaced intervals.

3. A gas burner head as claimed in claim 1 or 2, in which the upper surface of the burner port ring is of castellated formations with the upper surface of the castellations downwardly inclined towards the centre of the ring, the castellations at the horizontally-extended aperture locations being of lesser height than the other castellations at the ring outer circumference to define said apertures with the cap and castellations immediately adjacent thereto.

4. A gas burner head as claimed in claim 3 in which the lesser height castellations are circumferentially longer than the other castellations.

5. A gas burner head as claimed in claim 3 or 4 in which the lesser height castellations are at the inner circumference of the burner port ring inclined upwardly to engage a dished configuration in the lower surface of the cap to resist lateral disengagement of the latter.

6. A gas burner head as claimed in any one of claims 1 to 5, in which the lower surface of the burner port ring is also preferably of castellated configuration but shallower than the upper castellations and rests on an internal ledge in the ignition plate which is annular in configuration.

7. A gas burner head as claimed in any one of claims 1 to 6, in which the burner port ring has a projection on its outer surface adapted to engage a slot in a circumferential wall of the ignition plate at the ignition electrode location to prevent relative rotation therebetween.

8. A gas burner head as claimed in claim 7 in which the projection is grooved to assist gas flow to the ignition electrode.

9. A gas burner head as claimed in any one of claims 1 to 8, in which the ignition plate is cut away horizontal at its lower surface to provide an ignition chamber for the ignition electrode.

10. A gas burner head as claimed in any one of claims 1 to 9 in which the ignition plate is formed with small-diameter through-apertures upwardly and inwardly of the plate at the combustion chamber.

11. A gas burner head as claimed in any one of claims 1 to 10, in which the ignition plate, burner port ring and cap are formed of sintered iron and treated to give a black oxide protection coating while providing an attractive appearance.

12. A gas burner head as claimed in any one of claims 1 to 11, in which the ignition electrode is mounted relative to the combustion chamber by a stepped metal plate rivetted to the underside of the ignition plate.

13. A gas burner head substantially as hereinbefore described with reference to Figures 1 to 7 of the accompanying drawings.

14. A cooker incorporating at least one gas burner head as claimed in any one of claims 1 to 13 and associated with a centrally apertured spillage tray within the centre of which the gas burner head is located and a separable pan support.

15. A cooker as claimed in claim 14 in the form of a hob comprising a shallow tray to which a top apertured to receive spillage trays, pan supports and gas burner heads is secured, the tray being of a depth equivalent to a conventional worktop thereby permitting a drawer for example to be fitted immediately under the hob.

16. A cooker as claimed in claim 15 in which the hob has an ignition circuit connected to each gas burner head and a gas supply manifold pipe from which gas is supplied to the gas burner heads by Venturi or non-Venturi pipes there being an injector tap for each gas burner head.

17. A cooker as claimed in claim 16, in which the pipes are horizontally arranged and are formed of aluminium so that they are easily configured to a convenient layout in the cooker tray.

18. A cooker as claimed in claim 16 or 17 in which the pipes are bonded or cemented to a burner elbow connected to the ignition ring say by being peened over the stepped plate.

19. A cooker, substantially as hereinbefore described with reference to the accompanying drawings.

Printed in the UK for HMSO, D8818935, 11/84, 7102.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.